

Attachment D: Hardware Specifications

UASNY

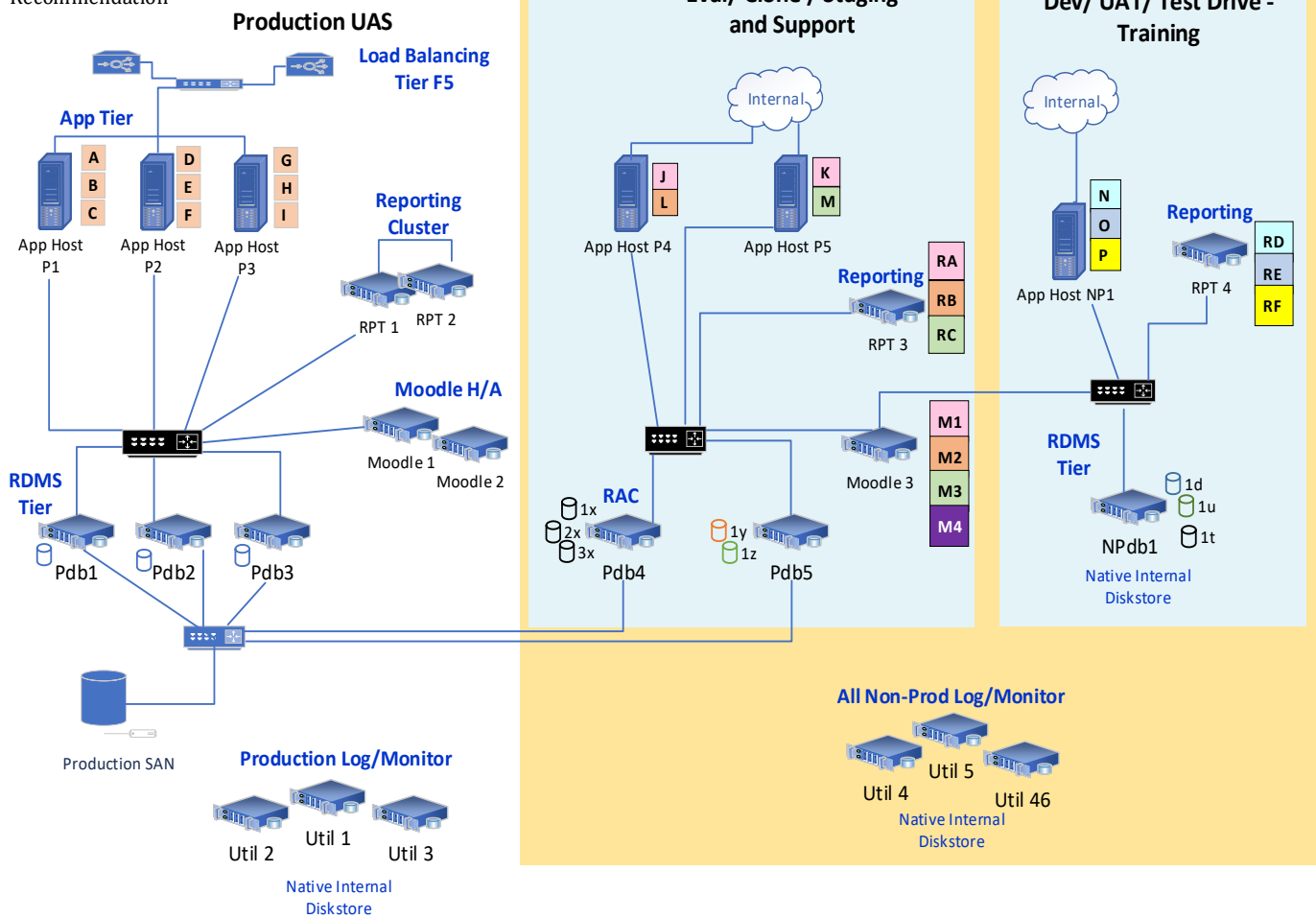
Legend for Physical Model Recommendation Diagram

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UASNY
Physical Model
Recommendation



Production

App Tier

App Host P1: Dell R540 (2x Xeon Gold 5118 2.3Ghz 12C) 128 GB RAM hosting 3 containerized instances of Oracle WebLogic Application Server. All cores licensed for Oracle WebLogic 11g.

- **A/B/C:** The instances of Oracle WebLogic Application Server Software running inside containerized O/S environments. These represent the production application server instances hosting the UAS.

App Host P2: Dell R540 (2x Xeon Gold 5118 2.3Ghz 12C) 128 GB RAM hosting 3 containerized instances of Oracle WebLogic Application Server. All cores licensed for Oracle WebLogic 11g.

- **D/E/F:** The instances of Oracle WebLogic Application Server Software running inside containerized O/S environments. These represent the production application server instances hosting the UAS.

App Host P3: Dell R540 (2x Xeon Gold 5118 2.3Ghz 12C) 128 GB RAM hosting 3 containerized instances of Oracle WebLogic Application Server. All cores licensed for Oracle WebLogic 11g.

- **G/H/I:** The instances of Oracle WebLogic Application Server Software running inside containerized O/S environments. These represent the production application server instances hosting the UAS.

Load Balancing Tier

Load Balancers: 2x F5 Big-IP i2600 appliances working in concert to distribute incoming requests and outgoing responses isolating and offloading security and message compression.

RPT2: Dell R740xd (2x Xeon Silver 4109T 2.0 Ghz 8c) 96 GB RAM hosting 3 containerized instance of MariaDB AX columnar datastore servicing OLAP needs internal and external to the UAS application. No license required.

Monitor and Log Management Tier

Util 1: Dell R740 (2x GOLD 5120 2.2G 14C) 64 GB RAM hosting resilient cluster of Graylog and Zabbix in their H/A configuration for log storage, aggregation, monitoring, and alerting. Hosts Graylog and Zabbix applications and their individual storage databases: MariaDB and MongoDB. Open source products: no licensing required.

Util 2: Dell R740 (2x GOLD 5120 2.2G 14C) 64 GB RAM hosting resilient cluster of Graylog and Zabbix in their H/A configuration for log storage, aggregation, monitoring, and alerting. Hosts Graylog and Zabbix applications and their individual storage databases: MariaDB and MongoDB. Open source products: no licensing required.

Util 3: Dell R740 (2x GOLD 5120 2.2G 14C) 64 GB RAM hosting resilient cluster of Graylog and Zabbix in their H/A configuration for log storage, aggregation, monitoring, and alerting. Hosts Graylog and Zabbix applications and their individual storage databases: MariaDB and MongoDB. Open source products: no licensing required.

Moodle H/A

Moodle 1: Dell R430 (1x Xeon E5-2620 2.1Ghz 8C) 64 GB RAM hosting MariaDB TX Moodle database in a high-availability active-passive failover replication mode. No license required for database.

Moodle 2: Dell R430 (1x Xeon E5-2620 2.1Ghz 8C) 64 GB RAM hosting MariaDB TX Moodle database in a high-availability active-passive failover replication mode. No license required for database.

Relational Database Tier

Pdb1: Dell 740xd (2x Xeon Gold 6134 3.2Ghz 8C) 128 GB RAM hosting 1 of 3 Oracle Enterprise Edition + RAC + Partitioning Cluster Instances. These three instances in concert represent a resilient H/A

configuration with any 2 servers supporting the anticipated production database load. All cores licensed for Oracle. Storage configured in the SAN.

Pdb2: Dell 740xd (2x Xeon Gold 6134 3.2Ghz 8C) 128 GB RAM hosting 1 of 3 Oracle Enterprise Edition + RAC + Partitioning Cluster Instances. These three instances in concert represent a resilient H/A configuration with any 2 servers supporting the anticipated production database load. All cores licensed for Oracle. Storage configured in the SAN.

Pdb3: Dell 740xd (2x Xeon Gold 6134 3.2Ghz 8C) 128 GB RAM hosting 1 of 3 Oracle Enterprise Edition + RAC + Partitioning Cluster Instances. These three instances in concert represent a resilient H/A configuration with any 2 servers supporting the anticipated production database load. All cores licensed for Oracle. Storage configured in the SAN.

Reporting Tier

RPT1: Dell R740xd (2x Xeon Silver 4109T 2.0 Ghz 8c) 96 GB RAM hosting 3 containerized instance of MariaDB AX columnar datastore servicing OLAP needs internal and external to the UAS application. No license required.

Storage Tier

Production SAN: Dell EMC Unity 300 + expansion enclosure configured to 40+TB presented LUN storage in the most conservative resiliency configuration. Spindles. 48 x 1.8 TB 12 GB/s 10K rpm 2.5" HDD. Storage of production-originated data is hosted in the SAN common to the production, Eval/QA, Staging/Datamart, and Clone environments. Production data is geographically replicated to identical DR SAN.

Eval/QA, Staging/Datamart, and Clone

Description

These environments make use of shared hardware through virtualization and O/S level container deployments. This sharing reduces licensing and hardware expenses allowing for a robust but cost responsible approach to infrastructure.

Note, these environments work with “production-originated” data either as a direct copy (datamart) or as a starting point for support investigation and scenario mapping. They thus share storage infrastructure with the production SAN for easy of copy, clone, and repopulation activities.

The Development, UAT, and Test Drive environments have limited access to a single common containerized shared Moodle instance hosted on the Eval/QA, Staging/Datamart, and Clone Moodle database host.

App Tier

App Host P4: Dell R540 (2x Xeon Gold 5118 2.3Ghz 12C) 128 GB RAM hosting 2 containerized instances of Oracle WebLogic Application Server. All cores licensed for Oracle WebLogic 11g.

- **J:** One of two containerized Oracle WebLogic instances deployed on server P5. Together with instance K on server P6 constitutes a production environment replication for Eval and QA support.
- **L:** One of two containerized Oracle WebLogic instances deployed on server P5. Provides singleton application function in the Staging/Datamart environment if an application server is active in the future.

App Host P5: Dell R540 (2x Xeon Gold 5118 2.3Ghz 12C) 128 GB RAM hosting 2 containerized instances of Oracle WebLogic Application Server. All cores licensed for Oracle WebLogic 11g.

- **K:** One of two containerized Oracle WebLogic instances deployed on server P6. Together with instance J on server P5 constitutes a production environment replication for Eval and QA support.
- **M:** One of two containerized Oracle WebLogic instances deployed on server P6. Provides singleton application function in the Clone environment.

Reporting Tier

RA: Containerized MariaDB AX instances collectively supporting the Eval and QA support environment.

RB: Containerized MariaDB AX instances collectively supporting the Staging/Datamart environment.

RC: Containerized MariaDB AX instances collectively supporting the Clone environment.

RPT3: Dell R740xd (2x Xeon Silver 4109T 2.0 Ghz 8c) 96 GB RAM hosting 6 containerized instances of MariaDB AX columnar datastore replication production reporting facilities. Instances deployed serve the Eval/QA, Staging/Datamart, and Clone environments. No license required.

Moodle

Moodle 3: Dell R430 (1x Xeon E5-2620 2.1Ghz 8C) 64 GB RAM hosting 4 containerized instances of the MariaDB TX Moodle database. No license required for database.

- **M1:** The stand-alone Moodle instance for the Eval and QA support environment.
- **M2:** The stand-alone Moodle instance for the Eval and QA support environment.
- **M3:** The stand-alone Moodle instance for the Eval and QA support environment.
- **M4:** The stand-alone Moodle instance shared for the Development, UAT, and Test Drive environments.

Relational Database Tier

Pdb4: Dell 740xd (2x Xeon Gold 6134 3.2Ghz 8C) 128 GB RAM hosting 3 Virtualized Oracle Enterprise Edition + RAC + Partitioning Cluster Instances. These three instances in concert represent the production cluster configuration for Eval/QA testing and support. All cores licensed for Oracle. Storage configured in the production SAN.

- **1x:** An instance of the Oracle database on RAC for Eval/QA support mirroring the production RAC deployment. 1 of 3 instances on a virtualized server Pdb4. Licensed for Oracle Enterprise Edition, RAC, and Partitioning.
- **2x:** An instance of the Oracle database on RAC for Eval/QA support mirroring the production RAC deployment. 1 of 3 instances on a virtualized server Pdb4. Licensed for Oracle Enterprise Edition, RAC, and Partitioning.
- **3x:** An instance of the Oracle database on RAC for Eval/QA support mirroring the production RAC deployment. 1 of 3 instances on a virtualized server Pdb4. Licensed for Oracle Enterprise Edition, RAC, and Partitioning.

Pdb5: Dell 740xd (2x Xeon Gold 6134 3.2Ghz 8C) 128 GB RAM hosting 2 Virtualized Oracle Enterprise Edition + Partitioning Cluster Instances. These two instances in concert represent the production cluster configuration for the Staging/Datamart and Clone environments. All cores licensed for Oracle. Storage configured in the production SAN.

- **1y:** An instance of the Oracle database for Staging/Datamart deployment. 1 of 2 instances on a virtualized server Pdb5. Licensed for Oracle Enterprise Edition and Partitioning only. Not RAC.
- **1z:** An instance of the Oracle database for the Clone environment deployment. 1 of 2 instances on a virtualized server Pdb5. Licensed for Oracle Enterprise Edition and Partitioning only. Not RAC.

Monitor and Log Management Tier

Note: *the monitoring for all non-production environments is shared and common across the Eval/QA, Staging/Datamart, Clone, Development, UAT, and the Test Drive environments.*

Util 4: Dell R740 (2x GOLD 5120 2.2G 14C) 64 GB RAM hosting resilient cluster of Graylog and Zabbix in their H/A configuration for log storage, aggregation, monitoring, and alerting. Hosts Graylog and Zabbix applications and their individual storage databases: MariaDB and MongoDB. Open source products: no licensing required.

Util 5: Dell R740 (2x GOLD 5120 2.2G 14C) 64 GB RAM hosting resilient cluster of Graylog and Zabbix in their H/A configuration for log storage, aggregation, monitoring, and alerting. Hosts Graylog and Zabbix applications and their individual storage databases: MariaDB and MongoDB. Open source products: no licensing required.

Util 6: Dell R740 (2x GOLD 5120 2.2G 14C) 64 GB RAM hosting resilient cluster of Graylog and Zabbix in their H/A configuration for log storage, aggregation, monitoring, and alerting. Hosts Graylog and Zabbix applications and their individual storage databases: MariaDB and MongoDB. Open source products: no licensing required.

Development, UAT, and Test Drive

Description

These environments make use of shared hardware through the use of virtualization and O/S level container deployments. This sharing reduces licensing and hardware expenses allowing for a robust but cost responsible approach to infrastructure.

App Tier

App Host NP1: Dell R540 (2x Xeon Gold 5118 2.3Ghz 12C) 128 GB RAM hosting 3 containerized instances of Oracle WebLogic Application Server. All cores licensed for Oracle WebLogic 11g.

- **N:** One of three containerized Oracle WebLogic instances deployed on server NP1. Constitutes the Development support app server instance.
- **O:** One of three containerized Oracle WebLogic instances deployed on server NP1. Constitutes the UAT support app server instance.
- **P:** One of three containerized Oracle WebLogic instances deployed on server NP1. Constitutes the Test Drive support app server instance.

Reporting Tier

RPT4: Dell R740xd (2x Xeon Silver 4109T 2.0 Ghz 8c) 96 GB RAM hosting 6 containerized instances of MariaDB AX columnar datastore replication production reporting facilities. Instances deployed serve the Development, UAT, and Test Drive environments. No license required.

- **RD:** Containerized MariaDB AX instances collectively supporting the Development environment.
- **RE:** Containerized MariaDB AX instances collectively supporting the UAT environment.
- **RF:** Containerized MariaDB AX instances collectively supporting the Test Drive environment.

Moodle

M4: The instance of Moodle M4 is hosted on server Moodle 3 shared in the Eval/QA, Staging/Datamart, and Clone server structure. Instance M4 is common to Development, UAT, and Test Drive.

Relational Database Tier

NPdb1: Dell 740xd (2x Xeon Gold 6134 3.2Ghz 8C) 128 GB RAM hosting 3 Virtualized Oracle Enterprise Edition Instances. All cores licensed for Oracle. Storage configured local to the server.

1d: An instance of the Oracle database for Development. 1 of 3 instances on a virtualized server NPdb1. Licensed for Oracle Enterprise Edition.

1u: An instance of the Oracle database for UAT. 1 of 3 instances on a virtualized server NPdb1. Licensed for Oracle Enterprise Edition.

1t: An instance of the Oracle database for the Test Drive environment. 1 of 3 instances on a virtualized server NPdb1. Licensed for Oracle Enterprise Edition.

Monitor and Log Management Tier

Note the monitoring for all non-production environments is shared and common across the Eval/QA, Staging/Datamart, Clone, Development, UAT, and the Test Drive environments.